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Educational Research Bulletin

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Another Measure of the Difficulty of Addition Combinations

By JOSEPHINE H. MACLATCHY

THE difficulty of addition combinations has been studied either as a function of the errors made by pupils in Grades IV to VIII or as a measure of the second-grade pupil's effort in learning the individual combinations. No one has looked to the child's way of acquiring addition facts, partly because we have all been sure that addition was a school preserve and that the occasional poachings of individual children did not make serious inroads upon the school's game.

In connection with a problem of first-grade readiness—What Number Do Children Know When They Enter School?—rather surprising facts appeared. Of the 2,300 children tested in September, 1928, there were only 10 per cent that knew no addition combinations when presented in problems or with objects. When the children were allowed to count, this portion decreased to 5 per cent. At the other extreme there were 5 per cent that knew the sums of the 20 addition combinations presented in the Number Test for Pupils Entering Grade I. The proficiency of the 90 per cent that knew some addition, also including the 5 per cent that knew all they were asked, provides the material to be discussed here.

The twenty addition combinations used in the test—those listed in the stub of Table I—were chosen at regular intervals from the Knight-Behrens table showing the difficulty of one hundred addition combinations, after two sets of combinations were struck out—the combinations containing zero and those with sums of more than 10.[1] Although the addition combinations were presented in two subtests, ten in verbal problems,

[1] Knight, Frederic B., and Behrens, Minnie S. *The Learning of 100 Addition Combinations and 100 Subtraction Combinations.* 1928. pp. 17–20.

and ten with objects, the results are pooled here with no injustice, I think, to either. Since each group of children was a large random sampling, I shall assume that we have before us data which, as far as they go, will yield tenable facts regarding the order of familiarity of these twenty addition combinations.

TABLE I

FAMILIARITY ARRANGED ACCORDING TO PERCENTAGES OF FAMILIARITY

ORDER OF AVERAGE FAMILIARITY	PERCENTAGE OF FAMILIARITY						
	Average	Cincinnati Non-Kindergarten (349)		Cincinnati Kindergarten (708)		Ten Cities (1,226)	
	(2,283)	Percentage	Rank	Percentage	Rank	Percentage	Rank
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5+1	69	56	3	80	1	70	1
2+2*	67	59	2	75	2	67	2
3+1*	67	62	1	73	3	65	3
7+1	62	50	4	72	4	65	4
1+7*	52	42	5	59	6	54	5
6+1*	51	38	8	62	5	52	6
1+9	50	41	6	59	7	49	9
1+6	49	40	7	56	8	50	8
8+1*	46	35	9	54	9	49	10
5+2	41	31	12	48	10	45	11
8+2	41	32	10	48	11	43	12
2+6*	41	26	13	44	13	53	7
2+4*	39	31	11	45	12	40	13
2+8*	35	25	14	41	14	39	14
4+4	32	24	15	35	17	38	15
4+6*	31	22	18	39	15	33	17
3+7*	31	20	19	39	16	34	16
5+3	30	24	16	35	18	32	18
3+5	27	23	17	29	19	28	19
4+5	20	16	20	22	20	22	20

* Combinations presented with objects.

THE measure which is used here is the percentage of the group which was familiar with the sum of a particular combination. This is a negative measure of difficulty, for the combination which was known by the largest percentage of these six-year-olds is assumed to be the easiest, and the combination known by the smallest percentage is assumed to be the hardest.

No assumption can be stated regarding the previous instruction of the members of these groups except that they had as yet received no formal school instruction. In Table I the Cincinnati group is divided into the 349 children who had not

attended kindergarten and the 708 who had attended kindergarten one year. The orders of familiarity for the two groups are not identical, but they are similar. The greatest variants between them are the differences in the percentages of each group familiar with particular combinations. The children who attended kindergarten always have the advantage of a larger percentage of familiarity. This is due to the incidental number experiences which are a definite part of the child's life in kindergarten. Interestingly enough, these practical number experiences have not seriously altered the order of familiarity.

In the first column of Table I the combinations used in the tests are listed in order of average familiarity for the two groups—the combination 5+1 known by 69 per cent of the 2,283 six-year-olds at Cincinnati and in the ten cities of Ohio is at the top of the column, and the combination 4+5 known by 20 per cent, the smallest percentage of familiarity for the whole group, is last.

The three most familiar combinations, 5+1, 2+2, and 3+1, according to the average percentages of familiarity, are also the most familiar for the six-year-olds of the ten cities and for the Cincinnati kindergarten children. All groups agree that 4+5 is the least familiar, while the Cincinnati kindergarten children and the six-year-olds from the ten cities agree with the average of all groups that the two next least familiar are 3+5 and 5+3.

The ranks of familiarity based upon corresponding percentages are given in Columns 4, 6, and 8 of the table for the two groups from Cincinnati and from the ten cities. The variations in order are slight. The greatest differences lie between the particular percentages for the children who had not attended kindergarten, on the one hand, and the percentages for those who had attended kindergarten at Cincinnati and for the ten cities, on the other. The uniformly higher percentages for the ten cities are likely affected by the large proportion of kindergarten-trained children in the groups from the ten cities, most of which had kindergartens in their school systems in 1928.

THE following conclusions seem to be implicit in the rankings of familiarity shown by the four orders of the combinations which are given in the table.

First, the easiest combinations are those in which the numeral "1" is added to a larger number.

Second, the most difficult combination among those with sums of ten or less is 4+5, a combination in which the addends are similar in size and in which the smaller is presented first.

Third, a combination and its reverse form; for example, 7+1 and 1+7 are not of equal difficulty. The one in which the larger number is presented first is the easier.

Fourth, the combinations containing "2," "3," and "4" seem to follow the same rule as those containing "1"; that is, the combination in which "2," "3," or "4" is added to a larger number is easier than its opposite.

Fifth, the combinations which contain a common addend are not of similar difficulty; for example, the percentages of familiarity of 5+1, 5+2, and 5+3 are 69, 41, and 30, respectively.

From this hasty summary of the facts shown by the table we may conclude that addition is not unknown game to the average six-year-old. But few, if any of them, have acquired in their poaching 100-per cent accuracy in their shots at addition. Their most serious inroads upon the game of the school are, also, likely limited to combinations with sums of 10 or less.

SINCE there are readers who may be interested in the subtests used, as well as the criteria for selecting the children tested, the portions relating to these are quoted from the directions to the teachers which accompany the Number Test for Pupils Entering Grade I, devised by the writer in collaboration with B. R. Buckingham.

Test 5. Fundamental Combinations in Problems—

This test may well be presented as a game—a game of "Finding How Many You Have." After the game idea has been established, read each problem slowly and record the child's answer on the Pupil's Interview Record. A problem may be read more than once if necessary for its comprehension.

1. If you have 5 pencils and get 1 more, how many pencils will you have then?

The following combinations are presented in problems of similar form:

7+1	1+6	4+5
1+9	5+2	5+3
4+4	8+2	3+5

Test 6. Fundamental Combinations with Objects—

Use 10 small objects—beads, buttons, or beans—which are alike in size, color, and shape. The first combination in this test is 2+2. Show 2 beans to the pupil and ask, "How many beans have I here?" After

the pupil has answered (correctly or incorrectly), cover the 2 beans and then show 2 more, asking the same question as before. Concealing the second group along with the first, ask, "How many are 2 beans and 2 beans?"

Present the following combinations in a similar fashion:

8+1	3+1	2+6
6+1	2+4	3+7
1+7	2+8	4+6

The method of selecting the children to be tested and the number of children in the groups considered were:

1. Criteria of Selection—
   Select from the register of the class the names of pupils whose birthdays were between March 1, 1922 and September 1, 1922, and who are entering Grade One for the first time. These are the names of the pupils to be tested.
2. Number Tested—
   1,226 six-year-olds from 10 cities of Ohio (Akron, Cleveland Heights, Hamilton, Kent, Lakewood, Lima, Marietta, Portsmouth, Toledo, Upper Arlington).
   1,057 six-year-olds from Cincinnati, Ohio.

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Home Ownership among Teachers

By T. C. HOLY

THE late H. H. Seerley, who was president of the Iowa State Teachers College for more than forty-two years, always maintained that every teacher should become a part of the community in which he was employed. One of the means of doing this, which he suggested, was to acquire a home and thereby become a taxpayer and direct contributor to the public enterprises of the community.

If one may judge from the discussions and comments during the past two or three years, the prevailing impression is that teachers are transients and, as such, make little or no direct contributions through public taxation. In order to have actual information on the problem of home ownership, one question in the inquiry blank used in connection with a study of teachers' salaries in the city of Cleveland dealt with this problem.[1] Of

[1] Holy, T. C., and others. *Cleveland Teachers' Salaries.* Columbus, Ohio: Ohio State University, 1932. Insert opposite p. 196. (Bureau of Educational Research Monographs, No. 16)

the 2,107 teachers who replied to this question 640, or 30 per cent, reported owning their own homes. There were 1,150 teachers who returned the inquiry blank without responding to the question. The percentage of home owners in the group who

TABLE I

DATA REGARDING HOME OWNERSHIP BY CLEVELAND TEACHERS

AMOUNT	NUMBER OF TEACHERS		
	Original Cost Plus Improvements	Assessment for Taxes	Amount Owed January 1, 1931
(1)	(2)	(3)	(4)
$ 999 and under	1	79	22
1,000– 1,999	8	10	36
2,000– 2,999	4	36	55
3,000– 3,999	17	52	62
4,000– 4,999	31	82	79
5,000– 5,999	35	97	68
6,000– 6,999	50	95	50
7,000– 7,999	49	56	41
8,000– 8,999	81	31	18
9,000– 9,999	57	32	12
10,000–10,999	76	17	7
11,000–11,999	50	8	2
12,000–12,999	48	14	7
13,000–13,999	25	2	1
14,000–14,999	18	2	2
15,000–15,999	26	1	1
16,000–16,999	18	.....	1
17,000–17,999	7	.....	2
18,000–18,999	13	1	.....
19,000–19,999	7	1	.....
20,000–20,999	5	1	.....
21,000–21,999	.....	1	.....
22,000–22,999	2	2	.....
23,000–23,999	2	3	.....
24,000–24,999	.....	.....	.....
25,000 and above	6	.....	1
Totals	636	623	467

did not reply is probably somewhat less than that of the 2,107 who did reply. This, however, is partially offset by the fact that the inquiry blank was not sent to any of the administrative staff. Furthermore, approximately 1,400 teachers who did not return the blank included about 60 per cent of the principals and a larger proportion of the senior high-school teachers than

were included among the 3,257 who did return the inquiry blank. Home ownership among these three groups—administrative staff, principals, and senior high-school teachers—probably runs considerably higher than among those replying because they are better paid and include a larger proportion of married men than would be found among the 3,257 who did return the inquiry blank.

Table I shows the distribution of the homes under the headings of original cost plus improvements, assessment for taxes, and amount still owed on January 1, 1931. This table should be read as follows: one teacher had a home which cost less than $1,000, 79 had homes assessed for less than $1,000, and 22 teachers owed less than $1,000 on their homes. Although, as already stated, 640 teachers reported owning their homes, only 636 gave the actual cost while only 623 gave the assessed value. It is also significant to note that 467, or 73 per cent, still owed on their homes. These have, no doubt, assumed those obligations on the basis of the present Cleveland salary schedule.

The total investment which these 636 reporting teachers had made in their homes up to September 1, 1932, amounted to $6,484,000. Six hundred twenty-three of the teachers gave the assessed value of their homes, which amounted to $3,546,500, or an average of $5,700 each. Four hundred sixty-seven of the teachers reported that on January 1, 1931, they still owed a total of $2,367,500. It is assumed that the difference between the 467 and the 636 who gave the amount of their investment represents the group who own their homes outright. When the original investment is compared with the obligations still due, it is found that 37 per cent of the original investment was still unpaid on January 1, 1931.

The question is, How does the proportion of home ownership among teachers compare with the population at large? According to the United States census, there were 221,502 families in the city of Cleveland in 1930, 81,155, or 37 per cent, of whom owned their own homes.[2]

When one considers that of 3,257 teachers who returned the inquiry blank, 1,427 were single women living with parents or near relatives, and 854 were single women not living with

[*Continued on page 82*]

[2] "Population Bulletin, Families, Ohio," *Fifteenth Census of the United States: 1930*, Bureau of Census, United States Department of Commerce, p. 52.

The Ohio Tax Dollar

By H. H. DAVIS

AN INTELLIGENT consideration of the problem of decreasing governmental costs should begin with an analysis of the present expenditures. Based upon figures presented in a series of articles in preceding numbers of this BULLETIN the following allocation of the governmental bill for Ohio in 1930 was made:

	Current Cost	Per Cent of Total
Education	$122,591,417	25.3
Other costs	177,384,316	36.3
Total current	$299,975,733	61.9
Capital outlay	136,384,937	28.1
Interest	48,291,756	10.0
Grand total	$484,652,430	100.0

It will be noted that the usual three types of cost are present: ordinary running expenses known as current cost, expenditures for permanent improvements designated as capital outlay, and payments for interest. This last item is not truly an expenditure for government at all but merely a payment made for the privilege of deferring the cost of government. A city hall or courthouse, for example, may cost $100,000. If this is paid by a bond issue the interest may be as much as $5,000 per year. This $5,000 is *not* an added cost of the building but is the cost of renting money and so postponing payment from our own funds. If people pay for government as it is needed, this item would, of course, not exist. Since this interest cost amounts to 10 per cent of the total governmental budget, we could reduce our taxes 10 per cent by merely "paying as we go."

Capital outlay accounted for 28.1 per cent of our total payments. This cost is now being sharply reduced, but, since it was largely financed by bond issues, the reduction in taxes will be slow. In 1930 almost $128,000,000 of new debt was incurred by the various subdivisions of this state, and about the same amount was retired. We are as usual paying with depression dollars, at high interest for costly boom-time construction, and refraining from taking advantage of the cheap money and cheap building costs offered by the depression. Part of the capital outlay of recent years has gone to building construction made

necessary by a rapidly growing population and by a rapidly changing society. It appears that the growth of population may be less rapid in the future and to that extent a permanently lower level of capital outlay may be expected. A large part of the building, however, is necessary to replace worn-out structures. Reduction in this type of outlay merely means that expense will have to be made in the future to care for it. With the present problem of tax delinquency there is ample reason in many cases for deferring capital outlay even though it must ultimately be made. A little more than half of all the capital outlay was for highways, streets, and bridges, and less than one-fifth of it was for education.

Current expenses of government account for only 61.9 per cent of the total, so it follows that only a little over 60 cents of each tax dollar is really used for the ordinary daily expenses of our government. People interested in schools will be interested to observe that only 25.3 per cent of our total budget is devoted to the running expenses of our entire public-school system from kindergarten through the university. A reduction of 20 per cent in this expenditure reduces the total government budget of Ohio by only 5 per cent.

Governmental costs have already been cut extensively in most areas. Further cuts should be made only on careful study, not only of the amount of the cost but of the value of each service rendered. The easy way to reduce budgets is that of making a flat cut of 5, 10, 20, or some other per cent in each item regardless of the worth of the service for which the item is to pay. There now is increasing evidence of a tendency to take the more difficult but safer way of reducing in proportion to value of the service. The most valuable services are thus reduced little and the less valuable ones much. It is often said that feeding and clothing people is more essential than educating them. To this point those interested in education do not object but feel that the same logic should be carried further. Just as relief measures take precedence over educational ones, so should educational budgets take precedence over other desirable but less necessary governmental costs. Even the most troubled countries of Europe are making especial efforts to support their schools, for they realize that in them rests the hope of adjustment to a changing world, and at the same time support of organized government.

Investigation of Teacher Supply and Demand Reported since November, 1931

By R. H. ELIASSEN AND EARL W. ANDERSON

DURING the last two months of 1931 and the year 1932, forty-nine articles on teacher supply and demand worthy of review were published.[1] Twenty-seven of these may be classed as research studies; seventeen are based on data that are at least state-wide in significance; the others are discussions of factors influencing demand, thoughtful reviews of other studies, or recommendations by non-investigators.

The most exhaustive study appearing during the period reviewed was made by Peterson and others for the state of Iowa (42). Three preliminary reports of the National Teacher-Training Survey by Evenden showed shifts in teaching positions and of sources of the supply of new teachers for each state (16). Umstattd gave a nation-wide picture in his report of teacher-placement success in 166 educational institutions (43). Overn presented indexes of supply and demand for the state of Minnesota (40). Williams studied the turnover of high-school teachers in Illinois over a ten-year period (47), and Van Houten reported tenure and turnover in Pennsylvania high schools (44).

Several reports appeared regarding placement success of graduates of specific institutions (4, 10, 12, 13, 34, 40). Lowry analyzed teacher supply and demand in each of the thirteen teachers'-college districts of Pennsylvania (27). Campbell surveyed the demand for inexperienced teachers in the accredited schools of the South (7). Eight reports were national in scope, nine covered individual states or divisions of states, and one covered a section of the country.

Some of the reports of 1932 are based on conditions now one, two, three, or four years old. The values are considerably decreased by the length of time elapsing between the collection of the data and the appearance of the reports. The general trend of oversupply has so increased over the past four years that some of the fields in which undersupply was reported are now crowded to quite a considerable extent.

[1] Previous summaries by the same authors: EDUCATIONAL RESEARCH BULLETIN, IX (November 5, 1930), pp. 437–73; X (December 9, 1931), pp. 479–83.

Numerous factors mentioned as influencing supply and demand in teaching are specified as follows:

Facts Influencing Supply—

A. Factors which cause an oversupply—
1. The tendency for former teachers to return to the teaching profession (1, 3, 11, 22, 30, 44)
2. Teaching salaries comparatively more attractive than formerly (3, 4, 22, 23, 34, 45, 47)
3. Reduction in non-teaching opportunities causing the preparation for short-time teaching by many who formerly planned other occupations (1)
4. Reduction in the number of women leaving teaching to get married (1)
5. The output of trained teachers (3, 4, 21)
6. Migration from position to position and from state to state (3, 4, 16, 17, 18, 34)
7. Lack of inter-institutional co-operation (32)
8. More men in teaching

B. Factors which reduce an oversupply—
1. More careful selection and guidance of teachers (1, 15, 22, 32, 40, 45)
2. Higher standards of teacher training (1, 15, 21, 22, 24)
3. Higher certification standards (32)
4. Revival of business (15)

Factors Influencing Demand—

A. Factors which cause need for fewer teachers—
1. Decreased birth rate (3, 11, 22, 24, 44)
2. Increased pupil-teacher ratio (1, 3, 4, 44)
   a) Elimination of small classes (1)
   b) Increased size of classes
3. Contraction or elimination of school services (1, 3, 15, 20, 22) Kindergarten, pre-school, special subjects, adult education, night schools, continuation schools, correspondence courses
4. Longer tenure of teachers (1, 22, 44, 45, 47)
   a) Fewer women leaving to get married
   b) Fewer leaving to enter other gainful occupations

B. Factors which cause need for more teachers—
1. Increase in enrollment (1)
   a) Changes in the compulsory-attendance age (15)
   b) Changes in the enforcement of compulsory-attendance laws
   c) Increased years of average attendance

C. Factors which cause change in demand—
1. Provision for equalizing opportunities in the elementary and secondary fields (32)

2. Expansion of school services (1, 2, 15, 16, 17, 18, 22, 44). Kindergarten, special subjects, adult education, etc.
3. Better opportunities for professional advancement (47)
4. Improvement in general financial conditions (10)
5. Changes in the number leaving teaching (44)
6. Changes in qualifications demanded of teachers (32, 34, 44). Age, sex, training, experience, marital status
7. Removal of personal and political prejudices and favoritism (7, 20, 32)

THE average percentage of placement of graduates in 166 educational institutions as reported to Umstattd was 68 in the high-school and 42 in the elementary-school field, respectively, 59 for the men and 54 for the women (43). Other institutions reported percentages as follows: Ohio State University, 49 per cent (4); University of Nebraska, 53 per cent, 65 per cent in the elementary and junior high school (34); University of Minnesota (40), a decline from 65 per cent in 1922–23 to about 30 per cent, 1929–30; State Teachers College of Terre Haute, Indiana, 76 per cent, which was lower than for the three preceding years (12); all colleges in Indiana, 70 per cent (13); 46 institutions in Pennsylvania, 17 to 95 per cent, the median being 60 per cent (10).

As has been true in the past the surplus was greatest in the fields of English, history, French, and the social sciences. There apparently was not a real shortage of teachers in any field in 1932, but the following are those in which opportunities were reported as relatively the best at the time the studies were made:

Commercial subjects (9, 10, 12, 15, 28, 29, 33, 36, 42)
Rural schools (22, 26, 27, 36)
Latin (4, 10, 12, 15, 33, 37)
Special education (10, 15, 26, 31, 36)
Industrial arts (4, 12, 15, 33, 36)
Home economics (4, 12, 33, 36)
Music (4, 12, 33, 36)
Geography (4)
Chemistry (4)
Elementary schools (15, 27, 36)
Junior high schools (16)
Physical education (42)
Certain combinations—English and Latin, athletics and mathematics, athletics and manual training, athletics and science (34)

Schools are everywhere curtailing their expenses, and it is rather surprising to note that the special fields of music, art, home economics, physical education, and industrial arts have been some of the first to feel the pruning knife. Thus these subjects have during the past two years changed from the best fields in which to specialize to fields that are now somewhat overcrowded due to the reduced demand.

During the present depression there has been a heavy influx of former teachers and of persons qualified to teach but who had not previously taught and who had been employed in other lines of activity. The supply of these persons is hard to estimate and thus complicates forecasts for future needs.

THE effects of an oversupply that are often mentioned are reductions in teachers' salaries (23, 34, 45); longer tenure and less turnover (44, 45, 47); and the tendency of the better teachers to leave the profession (23). The effect on superior teachers is summarized by Foster as follows: "The hazard of unemployment is not limited to recruits without teaching experience. An oversupply of inexperienced teachers with a minimum of training makes the experienced, more capable teacher's position either precarious or economically unprofitable" (20).

Some writers claim that a certain amount of oversupply is a good thing in that it permits employers to secure better teachers for each position (3, 21, 30, 35). Manuel contends that an oversupply of teachers is not so bad, since a great deal of the training for teaching is also a training for parenthood; and since "we need not feel that it is a greater waste to prepare teachers who will never have classrooms than it is to prepare others who will never follow their professions, or indeed than it is to invest in the ordinary liberal arts course without specific goal" (30). Such arguments are not convincing to the prospective teacher, who, having spent much time and money seriously preparing himself to teach, finds himself upon graduation unemployed and in debt.

No strikingly new recommendations or conclusions appear. The usual recommendations are made; namely, that state departments of education should raise the certification standards; that teacher placement should be more co-operative and state-wide; that there should be interstate co-operation in selection, preparation, and placement of teachers; more emphasis

upon guidance of prospective teachers; inducements for rural and elementary teaching; and added attention to the need for commercial teachers (29).

It may be concluded from these reports that the number of new teachers needed will not soon reach the high levels of 1930. Unless new emphasis is placed upon the expansion of public educational facilities into areas now little touched, the number of new teachers needed will be largely limited to replacements. There appears to be a gradual raising of requirements for new teachers, brought about partly by the oversupply.

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EDITORIAL COMMENT

Significance of Eye Imbalance in Reading Difficulties

THE latest of the "Harvard Monographs in Education" presents a new interpretation of the cause of certain types of reading difficulty.[1] Orton and Dearborn have conclusively shown the coincidence of left-handedness and left-eyedness with that extreme type of reading difficulty known as mirror-reading in which the handicapped individual confuses the letters "b" and "d," and such words as "saw" and "was." Indeed, the children suffering from this difficulty tested in the Harvard clinic were either left-dominant or equally dominant for right and left.

Many of the children, however, who in their reading merely reversed letters, omitted letters, or substituted letters were right-handed. Since all the children were of average and superior ability and the second group was not at all left-handed, some other contributing cause than hand and eye dominance had to be found.

The author of the monograph, *Lateral Dominance and Visual Fusion*, had himself been troubled with a tendency to lose his place when reading columns or lines of figures in mathematical problems which he had ascribed to an alternating of the vision of his eyes because it occurred when he had not been conscious of movement or of a change of the point of fixation. Upon inquiry he found that oculists were familiar with the occurrence of imbalance of the eye muscles which resulted in the inability of the two eyes to fixate the same spot on a page—known as "heterophoria." He found less familiarity with the fact of momentary blindness, "suspenopsia." Indeed, he found only a few members of the ocular profession who believed that imbalance of the eye muscles would affect reading, while "suspenopsia" was entirely disregarded by most of them.

He devised two tests which gave "unmistakable evidence of the existence of momentary blindness or alternating vision."

[1] Selser, Charles A. *Lateral Dominance and Visual Fusion.* Cambridge, Massachusetts: Harvard University Press, 1933. xvi+120 pp. (Harvard Monographs in Education, No. 12)

The essential part of the first test was a card to be used in the common stereoscope on which rows of digits were arranged so that the same digit never appeared in the same position before the two eyes. In the second test a white surface was viewed by one eye through a blue lens and by the other eye through a red lens.

Although many ocular practitioners maintain that there is no connection between disability in reading and imbalance of eye muscles, Mr. Selser has found that over 90 per cent of the reading-disability cases examined at the Harvard laboratory had eye-muscle imbalance. When he was told by practitioners who re-examined the cases that the imbalance was within the normal range of imbalance, he himself examined one hundred children in an elementary school at Cambridge and found that imbalance was not common among children of that age. Only nine of the one hundred children showed lateral imbalance, and five of the nine having imbalance also were having difficulty with their reading.

In spite of professional opposition met when he proposed that the children be fitted with prisms to correct this imbalance, Mr. Selser obtained most satisfactory results when he used such glasses with ten- and twelve-year children who presented extreme cases of reading difficulty. The results were contrary to the accepted theory that visual fusion cannot be developed after six years of age.

In this monograph Mr. Selser has shown that there is a definite relationship between muscular imbalance and mirror-reading, as well as the type of difficulty indicated by reversing letters, omitting letters, and substituting letters. This relationship is not generally recognized by professional oculists, for many of them are opposed to the remedy needed by these unfortunate children who, although they may be of average or superior ability, are often considered dull, even feeble-minded. Mr. Selser has also developed a technique for observing the alternating of vision by which it may be apparent even to the uninitiated laymen. Moreover, he has shown that the reading disability which results from muscular imbalance can be corrected by the use of prisms.

J.H.M.

READINGS

COE, GEORGE ALBERT. *Education for Citizenship.* New York: Charles Scribner's Sons, 1932. xvi+205 pp.

This is a shocking book! The reader will be startled wide awake whether he agrees or disagrees. First, What does citizenship mean? Take this in:

"Is not the true patriot willing to sacrifice his life in defense of our country? Certainly; of course. Our country must have the best possible defence against the occurrence of war. If preparation to win battles is the best possible defence against the occurrence of battles, then let every patriot ask for a definite part and function in a military establishment. Let the facts as to the causation of wars be determined, and then let political realism rule.

"But let us not deceive ourselves; the politically 'hard-boiled' are not the politically realistic citizens. Among them an abstract and visionary notion of 'our country,' 'our vital interests,' 'our national honor,' and 'patriotism' is dominant . . . with special interests, robed in general idealism, sub-dominant.

"Let us be realistic, likewise, about self-sacrifice for our country. Laying down one's life in war is not 'the supreme sacrifice.' Something far more difficult is demanded. It is easier to accept the risks of battle for oneself, and even for one's own son, than it is *to subordinate desire for profits* to love of country. This is a terrible assertion, but experience shows that it is true. The supreme test of the patriot does not come when he faces a foreign enemy, but when he faces his own neighbors—Jack, Mike, and the rest—as persons possessed of the same final worth that he claims for himself. The supreme sacrifice is not the giving of one's blood, but the *giving up of opportunity for power over persons* by reason of possessions. The stern call to patriotism today is a call repentantly to identify ourselves, as citizens, with the existing economic injustice and futility, and then to form a co-operative industrial commonwealth that shall express, as the political finality, the value of persons." (p. 199 italics the reviewer's)

Such persons are the ultimate value. The schools do not produce such persons today. Why? The answer is set forth in sentences and arguments that click and ring and penetrate to the quick. How can the schools produce such citizens? The answer is given, repeated, and driven home so that no one can forget. This is a shockingly illuminating book.

FREDERICK E. LUMLEY

MONROE, W. S., AND STREITZ, RUTH. *Directing Learning in the Elementary School.* Garden City, New York: Doubleday, Doran and Company, 1932. ix+480 pp.

The point of view of the authors is conservative. The teacher as portrayed is neither a tyrant nor a president emeritus. The book is rather the product of the experience and thinking of the authors than a compilation of the results of scientific investigation. It is assumed "that the pupil learns only as a result of participating in appropriate learning activities." The teacher's function is to determine immediate objectives, to stimulate, and to encourage. In this way the teacher directs learning. Learning is conceived in terms of problem-solving.

The mechanical make-up of the book is good and the activities suggested for the reader are excellent. A general bibliography is given at the end of the introductory chapter. The book is especially commendable in that it is written close to the level of the crossroads school. It is also strong in diagnosis and remedial instruction. For these reasons it merits a large sale. Those who use

it, however, must be prepared to supplement it considerably. The treatment is not related to curricular policies in general. It is not as forward-looking as it might be. Some of the elementary subjects, as spelling, for example, are not treated at all. There is no consideration of children's interests in reading, and no treatment of grade-placement in any subject. In arithmetic such important problems as the avoidance of abstract treatment in primary number work, methods of subtraction, methods of long division, the relation of decimal and common fractions, and the liberal elements of arithmetic are all omitted. The teaching of geography, history, and civics is submerged under social science. In like manner, music, drawing, industrial arts, and home economics receive inadequate treatment in a chapter entitled "Directing Learning in the Arts." In spite of these limitations, however, the book has much splendid content that will appeal to all those who are concerned with learning in the elementary school.

W. J. Osburn

Melvin, A. Gordon. *The Technique of Progressive Teaching.* New York: John Day Company, 1932. x+405 pp.

Every teacher would enjoy reading this book. It was written with the purpose of helping teachers in service and teachers in training to understand and to make use of the methods of the "progressive" schools, and it serves that purpose admirably. As the author explains, the function of the progressive teacher is not that of a taskmaster, but that of a catalyst in the learning process. And the teacher has faith in the eagerness and power of children to learn. The concept around which the book is built and in terms of which progressive teaching is analyzed is that of the "unit of living" or "unit of conduct." Once this is explained the author discusses the techniques of discovering and stimulating children's interests, selection of units of conduct suitable for school life, class management, securing order in the class, directing the learning of children, and he closes with a consideration of typical forms of class enterprise, using a great deal of illustrative material. Of special interest is the author's criticism of the extreme freedom which in a few progressive schools allows the whims of children to guide the learning process instead of the abiding interests which the children also possess. Again, the author advocates the use of standardized tests for the measurement of the tangible skills, the development of which he says is an important but minor part of school activity. In general, it can be said that the author has made an earnest attempt to apply the results of scientific work in education to progressive teaching.

R. J. Havighurst

Barr, A. S. *An Introduction to the Scientific Study of Classroom Supervision.* New York: D. Appleton and Company, 1931. xxv+399 pp.

Emphasis in this book is placed upon the necessity of securing objective, authentic, and valid data for supervisory standards and practice. The construction of a composite method of determining objectives of education, as opposed to reliance upon a single method, is advocated. A plea is made for a wider view and for the measurement of the less formal aspects and the non-intellectual traits in evaluating the products of instruction. The author recom-

mends a broad diagnosis in the study of causes of poor work. He stresses the need for more refined instruments for measuring the results of teaching. Suggested problems for further study and investigation are incorporated. This book is primarily for advanced students and workers interested in the scientific study of supervision.

MAE I. MCCRORY

COLE, ROBERT D. *Modern Foreign Languages and Their Teaching.* New York: D. Appleton and Company, 1931. xxiii+598 pages.

Mr. Cole draws heavily on the seventeen-volume report of the Modern Foreign Language Study. After a historical chapter containing startling enrollment figures (of 100 high-school beginners, 57 continue in second year, 20 in third year, 3 in fourth year), he treats the validity of objectives in the American democratic educational system. As each school elects objectives for its situation designed to bring optimum good to each registrant, a new course involving new textbooks must appear. Chapters follow describing the new course in comparison with current systems. Sample pages are reproduced from pioneer textbooks which are attempting to present the new materials.

The chapter on the Junior High School describes the chaotic state of modern-language instruction at that level and the need of careful and immediate investigation. The chapters on measurements, prognosis, supervision, and teacher training reveal a masterly study of progressive education by a man who brings to his task years of experience as head of French and Spanish in the Lawrenceville School with his present professorship in secondary education. His command and understanding of the current literature is enormous and meticulous; his bibliographies are monumental; his indexes a triumph of exactitude. His book will prove a gold mine to classes in method, to supervisors, and to progressive individual teachers for some time to come.

JAMES B. THARP

CAIN, NOBLE. *Choral Music and Its Practice.* New York: M. Whitmark and Sons, 1932. ix+145 pp.

The *a cappella* choir is one of the most recent organizations to find its way into the music departments of progressive high schools. Teachers have been enthusiastic over the educational and musical values of the choir and have often started such organizations with little background and experience. Americans have been forced to study foreign books on the problem until the advent of this thought-provoking and suggestive book by Noble Cain.

Many directors of choirs and supervisors of music will not agree with the author concerning his ideas of the educational values of certain phases of music, the time to start sight reading, and the care of the adolescent voice. The real value of the book lies in its detailed suggestions concerning the organization of the *a cappella* choir, the rehearsal, seating plans, and how to secure good tone quality, intonation, and interpretation. It has an excellently graded list of choral literature which should raise the standard of performance from average mediocrity to music of an excellent type. This list alone is worth the price of the book which will prove to be a veritable gold mine of information to directors of choral music.

JOSEPH A. LEEDER

HART, JOSEPH K. *Creative Moments in Education, A Documentary Interpretation of the History of Education.* New York: Henry Holt and Company, 1931. xvi+476 pp.

This collection of readings is intended to illustrate and "interpret" the history of education and of culture. It begins with a passage from Robert Briffault which presumes to tell how "the mind of man" originated; and it concludes with an article from the *Survey* on a dream school which the future may make an actuality. There are seventy selections, of an average length of about six pages. Each selection is prefaced by a short introduction which also includes a statement of the source. Brief indication of the sources should also be given in the table of contents, but this is not done. There are some questions in an appendix; and the book is indexed. Teachers and students of the history of education and of the making of this mind of ours will probably find this a practical and suggestive book; but the present writer cannot yet speak from experience of its use with classes.

H. G. GOOD

BOGOSLOVSKY, CHRISTINA STAEL VON HOLSTEIN. *The Educational Crisis in Sweden in the Light of American Experience.* New York: Columbia University Press, 1932. xiv+301 pp.

This study is centered on the Swedish Education Act of 1927, which introduced the common foundation school of at least four years, and numerous other changes in the public-school system. In order to promote an understanding of this law and the present educational situation, the author discusses the political and social background, and previous educational history of Sweden. She then turns to American educational experience. After a review of earlier American influence on Swedish education, she passes to a discussion of some of the more important ways in which experience in this country should be of value in the solution of Swedish educational problems, notwithstanding the important differences between the two countries. The author has a wide acquaintance with the educational conditions and literature of both countries, and has produced a useful study in comparative education.

R. H. ECKELBERRY

SADIQ, ISSA KHAN. *Modern Persia and Her Educational System.* New York: International Institute of Teachers College, Columbia University, 1931. ix+125 pp.

This is no *Cyropaedia* but a picture of the strides Persia has made educationally and otherwise since the establishment of the Pahlavi dynasty (1925). We see Persia trying to bring her ideas up to the level of the West through the agencies of nationalism and the industrial revolution.

The strongest element in Persian education is religion, but the Mohammedan clergy "lost [its] influence and prestige the day modern education took root." Just as China had her Confucius and Greece her Homer so Persia has her Sa'di. The private-initiative attitude, the idea that anyone who knows something can teach it, the notion that children should become productive as soon as possible die hard. But under the French influence which became dominant for political reasons, Persia has begun to centralize, to control private and foreign schools, to give state examinations for civil service. Elementary

and secondary schools are being reorganized. There is no Persian university but there are various higher schools. Each year two hundred students chosen by competitive examinations are sent to foreign universities, particularly French, German, and American. An interesting feature of the law is that 35 per cent must study education. The volume is not well documented nor indexed, but the author apparently knows his subject.

CLARKE L. FOSTER

HONEYWELL, ROY J. *The Educational Work of Thomas Jefferson.* Cambridge, Massachusetts: Harvard University Press, 1931. xvi+295 pp. (Harvard Studies in Education, No. 16)

Herbert B. Adams of Johns Hopkins issued his study of *Thomas Jefferson and the University of Virginia* more than forty years ago. Two years ago C. F. Arrowood published a book on *Thomas Jefferson and Education in a Republic* published by McGraw-Hill. The book under review is in many ways the best of the three. Most of its parts have been printed before, but they have not been brought together before. In the context one may perhaps discern a tendency to claim for Jefferson's educational ideas a greater degree of originality than they possess and a correlative tendency to lean upon Philip A. Bruce's *History of the University of Virginia,* not only for facts, but for statements of opinion about Jefferson. Jefferson did not, for example, invent the elective system or the scheme of academic specialization. In general, however, the interpretation is moderate and defensible. There is a bibliography but no index, a want which in a book of this sort is utterly indefensible.

H. G. GOOD

BINGHAM, W. V. *Psychology Today.* Chicago: University of Chicago Press, 1932. 450 pp.

The publication of the complete series of psychology radio talks and listeners' notebooks in one volume will be welcomed by all those who wished to have their fleeting memory of the National Advisory Council talks reinstated in more permanent form. Review of the series in cold print shows that any reader desiring to introduce himself to the study of psychology could scarcely find a more acceptable means. Since the talks were written to be understood over the air, they are easily understood when read. Mr. Bingham, whose endeavors shaped the content and presentation of the series, is to be congratulated on his radio success and on the value of the printed memorial.

Lest I be accused of being a wholly benign critic, I offer one or two suggestions which I think would improve the radio material and printed guides when bound together. If the appropriate sections of the listeners' notebook containing suggestions for study and reading could have been placed after each talk, the reader would have been aided. Furthermore, talks on the same topic are found in several different sections, as, for instance, those on learning. For study purposes, the material on learning might have been classified together.

One of the principal contributions of this book to the general field of psychology is its absence of bias. It presents psychology in usable form, without unnecessary and untenable theory. For this reason, as well as for its style of writing, I should like to see it tried out as an elementary psychology text.

F. H. LUMLEY

BRILL, ALICE C., AND YOUTZ, MAY PARDEE. *Your Child and His Parents.* New York: D. Appleton and Company, 1932. xii+339 pp.

This book is intended as an elementary text for parents' study groups, and has been developed out of the authors' experiences with groups in Iowa. The method used in the book is that of presenting simply a few ideas on each topic and subtopic, often in the form of questions, then giving an illustration or illustrative comment, quoting remarks contributed by parent members during group discussions. The topics are those usually chosen by parents for their first year's study; most of the content material for their work was derived from the supplementary references given in the body of the textbook and at the end of each chapter, and therefore is not given in the book.

Parents' study groups using this book will be encouraged by realizing that the remarks and experiences contributed by them to their own discussion periods will compare favorably with the quotations recorded by the leaders of the Iowa groups.

JESSIE A. CHARTERS

MYERS, GARRY CLEVELAND. *Developing Personality in the Child at School.* New York: Greenberg, 1931. xv+375 pp.

The author has thrown into readable form a great deal of material and many practical suggestions concerning the development of personality in children. In the past, school literature has dealt largely with the teaching of subjects in the elementary and high school, but increasingly more attention is being paid to the moral and personal problems of children, as perhaps the most important area in education. This book is in line with the newer trend of the thought and interest of teachers, and it is written in a style well adapted to understanding and use by the classroom teacher.

W. W. CHARTERS

MURCHISON, CARL. *Handbook of Child Psychology.* Worcester, Massachusetts: Clark University Press, 1931. xii+711 pp.

This handbook is the most recent addition to the series entitled "The International University Series in Psychology." Among the foreign contributors to this volume are Charlotte Bühler, Kurt Lewin, Susan Isaacs, Jean Piaget, Anna Freud, and C. W. Kimmins. The American contributors represent those schools in which the most extensive studies in child psychology have been carried on, such as Columbia University, the Universities of Minnesota, Iowa, California, Yale, Stanford, and the Chicago Behavior Research Fund.

The wide range of subjects covered in the articles makes this book an indispensable reference and handbook for the student of child psychology. The material presented is for the most part the result of experimental investigation of the problems in the field of child psychology.

The editor explains the omission of a chapter on the delinquent child by suggesting that delinquency is a social, rather than a psychological, problem.

Each section of the book is followed by a complete bibliography which includes the titles of the most recent articles and books. This is one of its most valuable features. The reader feels that every effort has been made to make this a comprehensive presentation of the facts of child psychology as discovered by experimentation.

AMALIE K. NELSON

ELSBREE, WILLARD S. *Teachers' Salaries.* New York: Teachers College, Columbia University, 1931. vi+286 pp. (Teachers College, Columbia University, Contributions to Education, No. 300)

The more or less successful efforts of boards of education throughout the country to balance school budgets makes any thoroughgoing study of teachers' salaries of unusual significance. This study deals with such basic factors as economies of teachers' salaries, equal pay for equal work, rating of teachers for salary purposes, types of salary schedules and techniques for predicting their cost, and the ability of communities to support teachers' salaries. Not only the data contained in the study but the techniques, particularly those for determining probable cost of salary schedules, should prove useful for not only boards of education and administrators but for teachers as well.

T. C. HOLY

BLACKHURST, J. HERBERT. *Introducing Education.* New York: Longmans, Green and Company, 1932. xiii+319 pp.

"This textbook is designed to give first year students such a preview of the general field of education as will guarantee to them increased efficiency." This opening sentence of the author's Introduction is a concise statement of what he has attempted. The book is elementary, interestingly illustrated, and readable. It contains chapters dealing with the meaning, cost, and development of modern education; the relationship of education to psychology and sociology; the meaning of curriculum; tests and methods; and an outline of education from the pre-school through the high school. The closing chapter is an interesting résumé of the profession of teaching which should serve to assist the student in making a choice with respect to teaching as a life work. While the reviewer does not share the author's position that the work should be used as a textbook, it would be a helpful evening's reading for any student who is looking toward teaching as a profession.

H. B. WYMAN
Phoenix Junior College

RUST, METTA MAUND. *The Effect of Resistance on Intelligence Tests Scores of Young Children.* New York: Teachers College, Columbia University, 1931. xi+80 pp. (Child Development Monograph, No. 6)

In the present study, the following questions were raised: To what degree does resistance, as measured by tests refused, influence intelligence-test scores of three-year-old children? To what extent and by what means can such resistance be overcome? What is the relation of resistance to mental age, intelligent quotient, and the difficulty of the test? Which tests are most frequently refused?

The author states that resistance is defined as any form of behavior other than attempting a test within thirty seconds after it has been presented. The Kuhlmann-Binet and Merrill-Palmer Scales were administered to 100 three-year-old children, equally divided as to sex. None of the children had been tested before this experiment was undertaken, and only five had attended a nursery school. Thirty-one per cent of the group showed no change in Kuhlmann-Binet intelligence quotient, and 70 per cent showed no change in Merrill-Palmer intelligence-quotient points as a result of resistance. Fifty-

eight per cent of the Kuhlmann-Binet and 78 per cent of the Merrill-Palmer test refused by children were later passed. The less resistant group showed a tendency to have the higher average intelligence quotient.

Tests which were more difficult, such as those including verbal responses, were resisted more frequently than the less difficult tests or those with the use of some kind of materials. The Merrill-Palmer tests were more markedly acceptable than were the Kuhlmann-Binet. No significant and consistent sex differences were revealed. Resistance was unevenly distributed and in its overt manifestation far from universal. The author agrees with Goodenough in stating that "at least in its overt manifestation, the reaction is one which is highly subject to modification by training." The results clearly demonstrate the advantage of the device used by Stutsman in correcting for refusals. It is interesting to note that Goodenough, Stutsman, and Nelson report much less resistance to tests than was previously thought. This finding, according to the present author, may be due to a better understanding of desirable means of gaining the co-operation of the children.

It might be suggested that a similar study be made using the Merrill-Palmer and the Minnesota pre-school scales.

HELEN C. SMITH

WALDMAN, JOHN L.; WADE, FRANCIS A.; AND ARETZ, CARL W. *Hearing and the School Child*. Washington: Volta Bureau, 1930. 222 pp.

In these days of the school use of radio studies of the hearing of public-school children are especially significant. The results of three investigations are reported in this book: the first concerns the hearing scores for children, and a comparison of right- and left-ear hearing; the second takes up the relationship between hearing and school progress; and a final section is devoted to hearing and subject achievement. An interesting fact revealed by this study is that the percentage of white children having impaired hearing is greater than the percentage of colored children. Surprisingly low correlation was found between school progress and hearing ability after various obscuring factors had been removed. These correlations ranged from .18 to .29. For anyone interested in presenting auditory material to school children, this book is invaluable.

F. H. LUMLEY

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Home Ownership among Teachers

[*Continued from page 63*]

parents or near relatives, Cleveland teachers compare favorably with the population of the city at large. Certainly, so far as this city is concerned, the charge that teachers are non-contributors so far as direct taxation is concerned applies no more to them than to the population as a whole.

NEW TESTS

THE Malin Diagnostic Test in the Mechanics of High School Chemistry is published in two forms by the Public School Publishing Company. The first part of the test measures the student's knowledge of the chemical and physical properties of gases by a crosshatch arrangement in which the student checks each gas on each property. A sampling of four gases, four physical properties, and two chemical properties were used for each test. In the second part of the test there are four questions on laws and theories, three of which are information and one the application of a chemical principle. A second group of five exercises consists of balancing a formula when the valences of the elements and radicals are known. In another group of six exercises the formula of a compound is recognized by writing its name on the blank line; then the names of other compounds are recognized by writing their formulas on the blank line. A fifth set of fourteen exercises on writing equations is given; balancing the equation by denoting the number of molecules of each reactant and each product and by denoting the number of atoms of an element in a molecule; completing and balancing an equation in which only the formulas for the reactants are given; writing and balancing an equation for a chemical process, and writing and balancing an ionic equation. The last group of six exercises requires the solution of chemical problems. Throughout the test empirical formulas are used in balancing equations. The test does not cover the manipulation of structural formulas. If this is an important objective of high-school chemistry the difficulties of students in this direction should also be diagnosed.

The exercises were selected for the test on the basis of an analysis of six chemistry textbooks and manuals, errors made by students, and the analysis of the College Entrance Board Examinations.

As the title indicates, the test is designed to diagnose the difficulties of students in the mechanics of high-school chemistry and its related fundamentals. Although the test as a whole has a reliability coefficient of .87, there is no evidence that the size of the sample exercises for each of the difficulties is suffi-

ciently large to obtain a reliable index of whether students are achieving each objective measured. From the reliability of the whole test and by inspection it appears that the sampling of situations must be larger for reliable results.

One of the economical problems in measuring the achievement of pupils is the time and money spent in scoring examinations. An interesting method has been devised by which the reactions of pupils are automatically evaluated at the time the pupils react to the test exercises. The Clapp-Young Self-Marking Arithmetic Test in concrete problems is published by the Houghton Mifflin Company and consists of a four-page leaflet. The pupil selects the answer to the problem from a group of four answers and places an x in the square beside it. In so doing the mark is transferred by a narrow strip of carbon to the back of the sheet. The test exercises are printed on the front and last pages of the leaflet, which is so arranged that the pupil cannot see the inside pages. The scoring consists merely of counting the number of marks appearing in the squares on the inside pages. On the same pages the four choices of answers are given with the probable methods by which they were obtained. Here, again, the device is economical in easily discovering the common errors the pupils are making without a tedious analysis of the pupils' work. The pupils may also make use of the tests in ways which may be helpful to them in improving their methods of problem-solving.

The coefficient of reliability is .79, which yields a probable error of 2.45 for an individual test score. In other words, the chances are even that a pupil's score is within 2.45 points of his true score. The test is diagnostic of a pupil's achievement in solving arithmetic problems as covered by the phases of arithmetic mentioned previously but is hardly reliably diagnostic of problem-solving in each phase. Grade norms are given for Grades V to VIII, inclusive, and age norms for ages eleven to fourteen. The time required for administering the test is 35 minutes.

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